Rana University
Faculty of Science
Computer Science Department

Course Title	**Advance Networking**
Lecturer Name	**Baitullah Paktin**
Credit Hours	**4**
Lecture Days	**Sunday-Monday/Tuesday-Thursday**
Lecture Timing	**Early Morning, Afternoon, Evening**
Class No.	**602, 602, 604, Lib**

Course Description

The advanced networking course includes the associate level introduction and configuration of Cisco networking and internetworking devices (especially switches and routers). In this course, the most important topics from the Cisco CCNA course are included. This course has a 50-50 theoretical and practical portion. The simulations tools like Cisco Packet Tracer & GNS3 as well as physical cisco devices are used. This course will enable the students to build, configure, manage and troubleshoot small to medium size networks using cisco devices.

The main topics covered in this course are:

- Routing along with its types
- Routing protocols such as RIP, OSPF & EIGRP
- ACL
- NAT
- VLAN
- Switch-port Security
- STP

Course Objective

The main objective of the course is to equip the students with the knowledge and skills of cisco switch and router configuration. By the end of the course, the students will be able to build, manage, control and troubleshoot small to medium size networks using the cisco devices (Routers & Switches).

Teaching Method

- Lecture/Explanation/short notes
- Previous lesson’s review
- Discussion
- Questioning
    - Hands-on/Inquiry

- Presentations
    - Cooperative groups
    - Other _____

Learning Outcome

:By the end of the course, students will be able to
.Define network and internetworking .1
Configuring and upgrading the several Networking devices such as Router, Switch, .2
.and Hub
.understanding all IP related along with its classes, Subletting and VLSM .3
Understanding of Cisco IOS .4
.Configuring the Telnet and SSH .5
.Applying, verifying and troubleshooting all the route methods .6
.Recognizing the best path selection through four well-known routing protocols .7
.Creating VLANs and Inter-VLANs .8
.Determining and verifying ACL with its types .9
.Configuring NAT .10
.Assigning IPv6 on the network devices .11

Course Plan

Weeks	Chapters	Teaching Method	Remarks
1	Introduction of the course: - Introduction to the course - Introduction to network & internetwork - Introduction to Cisco Courses: - Broadcast domain and collision domain - Hub operation - Switch operation - Router operation	Theory + Practical	HOMEWORK
2	**Introduction to IP, sub-netting & VLSM** - IPv4 & its classes - APIPA & Loopback IP - Private & Public IP - VLSM - Sub-netting IPv4 - Subnet mask notations	Theory + Practical	HOMEWORK
3	**Cisco IOS, Accessing Cisco Router/Switch, Router/Switch Boot Process & Cisco Router Modes:** - Cisco ISO - Accessing Router/Switch by multiple methods - Router or switch boot process - Cisco router modes - CDP	Theory + Practical	HOMEWORK
4	**Telnet & SSH:** - Introduction to Telnet and SSH - telnet configuration and verification	Theory + Practical	HOMEWORK

	- SSH configuration and verifications **COMPUTER LAB (STUDENTS PRACTICE)**		
5	**Routing** - Static routing - Default routing - Dynamic routing - Pros and cons of static routing - Link-state routing protocols - Distance vector routing protocols - Hybrid routing protocols - AD value Metric	Theory + Practical	HOMEWORK
6	**Static Routing & Default Routing:** - Configuration of static routing - Configuration of default routing - Trouble shooting of static and default routing - Verification commands for static and default routing **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
7	**RIPv1 & RIPv2:** - Detailed description of the RIP - Difference between RIPv1 and RIPv2 - RIPv1 and RIPv2 configuration - Troubleshooting and verification of RIPv1 and RIPv2 **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
8	**IGRP & EIGRP:** - Detailed description of IGRP - Detailed description of EIGRP - Difference between IGRP & RIP - EIGRP configuration - EIGRP troubleshooting and verification **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
9	**Computer Lab session:** Hands on lab: Practicing RIP, SSH, Static Routing, EIGRP	Practical	HOMEWORK
10	**OSPF:** - Detailed description of OSPF - DR & BDR operations - Setting RID - Configuration of OSP - Troubleshooting and verification of OSPF **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
11	**Switching, STP & switch-port Security**	Theory + Practical	HOMEWORK

	- Switch operations - Switch functions - Introduction to STP - Root bridge and Non-root bridge - Designated and non-designated ports - Switch priority - Managing STP - Working with switch-port security **COMPUTER LAB (STUDENTS PRACTICE)**		
12	**VLAN** - Introduction to VLAN - VTP - VTP Domain - VTP Modes - Frames tagging - Frame tagging protocols o ISL o Dot1Q Access and trunk ports	Theory + Practical	HOMEWORK
13	**VLAN & Inter-VLAN configuration** - Inter-VLAN routing using: o Using multiple links o Using router on-stick - Configuration of VLAN and inter-VLAN routing - Troubleshooting and verification of VLAN **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
14	**ACL** - Standard ACL - Extended ACL - Named ACL - ACL Configuration - ACL verification **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
15	**NAT** - NAT - PAT - Static NAT - Configuration of PAT using ACL - Verification of PAT **COMPUTER LAB (STUDENTS PRACTICE)**	Theory + Practical	HOMEWORK
16	**Working with IPv6:** - Introduction to IPv6 - Assigning IPv6 to routers - Routing using IPv4 **COMPUTER LAB (STUDENTS PRACTICE)**	Theory+Practical	HOMEWORK

Refere nce	▪ CCNA Routing and Switching Study Guide - Lammle, Todd

Class Discipline

To maintain control and manage the classroom properly I'm applying the following rules and discipline in my classes.

- Trying to include rules on my syllabus.
- Talk about my rules on the first day of class
- Trying to know students by name.
- Trying to act professionally.
- Exploring the discipline issue before acting.

Assessment Method

A useful beginning point in determining the optimum mix of assessment methods is the resources and I select the

Following assessment method.

- Independent Work
- Guided Instruction
  - Practice Sheets
- Project/Presentation
  - Conference with students
  - Test/Quiz
  - Other _____

Exam Method

Not allowing the students to whisper during the exam. (If catch the place will be - changed)

.Cheating by any means the paper will be canceled -

.Not allowing to use cell phone, mobile, tablets …etc-

.Exam will be conducted written -

Prepared by:

Approved by

Baitullah Paktin Fardin